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Mail Stop 1700C2
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Dear Sir: November 3, 1993

A Request for Rule Interpretation. We have been developing an exciting technology that improves safety at airports that provides consistent and reliable CTAF/Unicom Services. We are now seeking from the FCC a Rule Interpretation that would allow us to formally offer this technology to the State Aviation Officials on a nationwide basis. After a few months of getting different forms from Gettysburg, and upon contact with Sean White of your office, I believe at last that you are the wise one for whom we have been seeking.

FAA Review. After several people at FAA headquarters reviewed our system's features and capability, Myron Clark, a senior Aviation Safety Inspector with FAA Flight Standards Technical Programs Division, (the department that evaluates such matters), has offered to be available to the FCC to assist in classifying our new technology appropriately.

Mr. Clark suggested that our device is a "CTAF Advisory System for VFR Operations at Non-tower controlled airports." (CTAF, Common Traffic Advisory Frequency). Specifically he felt that our system was not an AWOS by the FAA's view, and thus it can and should operate on an airport's existing CTAF. By operating on CTAF we would be providing the benefits of improved safety through consistent CTAF advisories, avoid a further burden on the limited radio spectrum available, and not require a discrete frequency, such as would be necessary for a continuous AWOS transmission. Mr Clark is available at FAA headquarters and is expecting a call from your office (202) 267-7955 at your convenience.

Intended Use. The system is intended to supply advisory information specifically at non-tower controlled, non-FSS, non-AWOS equipped airports. By design our VFR Advisory system operates within the purpose and scope of standard Unicom/CTAF and to comply specifically with FCC Regulations, parts 87.213 for Unicom and 87.237 for Multicom CTAF, in their entirety.

Overview. As a bit of background, and as you may already be aware, CTAF/Unicom/Multicom advisories are very unreliable at most smaller, non-tower-controlled airfields. These represent something on the order of 12,000 of the 14,000 airport facilities in the US, ie the vast majority of airport facilities. We have developed and debugged a system which provides pilots with consistent, 24 hour advisory and radio check replies. We have affectionately named the system the "SuperUnicom."

Advisory. To provide the standard Unicom Advisory that pilots hope for at smaller airports, our SuperUnicom system monitors the airport's unicom frequency and *upon pilot request* provides regular advisory information (As per FCC Reg 87.213(b)(1)). The pilot makes their request for advisory through three clicks of their aircraft's microphone. Internally the SuperUnicom first:

1) Measures the general congestion on Unicom to determine how extensively to abbreviate its advisory information,

2) Confirms that there are no other transmissions occurring on the frequency so that it will not "step" on any other transmissions,

3) Responds to the pilots request over CTAF with the appropriate advisory information. The system actually behaves more carefully and consistently than most airport managers do at their Unicom station!

Radio-Check. When activated by four clicks of their microphone's, the SuperUnicom also offers pilots the perfect Radio-Check. Aircraft "Radio Checks," often a check critical to flight safety, are frequently hit or miss at most airports. Typically pilots only get, on occasion, a the vague response "loud and clear." Upon the pilot's request for a radio check, by four clicks of their aircraft microphone, the SuperUnicom echoes back the pilot's next radio transmission (Limited to just a few seconds). This approach precludes any false positives and allows the pilot to actually hear and judge the strength and quality of their aircraft radio's transmission and reception. We call it a "Radio-Echo-Check."

Instructions to Pilots. Perhaps the most unusual feature we have developed is a unique means to inform pilots of how to operate the advisory system. We call this its "PopUp" capability. There are only a few alternatives to informing pilots of how to activate the system:

1) Published instructions in the FAA Airport Facility Directory,

2) Instructions posted at the airport,

3) A very short announcement over the Unicom frequency itself.

The first two methods are easily implemented. To provide for the third we have developed as an optional feature the ability for the SuperUnicom to intelligently transmit a three second burst of instructions on how to actuate it (See below). As with all other transmit functions the SuperUnicom follows these precautions:

First: The system determines the level of general congestion on the frequency and spaces its instructions more widely as congestion increases; staying silent if the frequency is too busy or quiet.

Second: It verifies that there have been no transmissions whatsoever within the last 10 seconds,

Third: It determines that there are no current transmissions by others that it could accidentally "step on,"

Fourth: The system then transmits its 3 second instructions, "Potomac Airfield, 3 clicks for Advisory, 4 clicks for Radio Check."

FCC Approved Transceiver. After some careful evaluation we selected the Terra TPX 720 Transceiver as the actual transceiver radio within the SuperUnicom. Not only could we confirm that it was properly licensed and meets the specifications of the FCC, the FAA as well as ourselves, but we confirmed that its squelch circuit detects carrier from within the IF stage of the radio, ie the correct way. We in turn monitor this radio's squelch detection output to identify the presence of any modulation or transmissions on the selected CTAF frequency. In no way do we tamper with nor modify the radio. This maintains the FCC license for the radio (as well as manufacturer warrantees!)

We particularly liked the Terra TPX 720 because we could attenuate its output down to 500 milliwatts. This output level can be easily transmitted over by aircraft radios and it is also just enough power to be heard within the traffic radius of a single airport (3-5 miles). The manufacturer TERRA includes an FCC Form 406 with each radio, but we felt that to obtain licenses for SuperUnicom's in this manner would be oblique at best. Thus our request for rule interpretation.

Summary. From what I have gleaned so far from the people I have spoken with at FAA Spectrum Engineering, Flight Standards, Rules & Procedures and the FCC, radio spectrum is a precious commodity. Our device offers a technology that 1) Improves safety dramatically for pilots at the many airports that do not have control

towers, FSS facilities, nor AWOS installations, 2) Requires no additional radio spectrum, and 3) Uses current spectrum more consistently and efficiently.

Our next logical step is to clarify any outstanding issues so that we may formally provide this technology to the airports in need of it. We have been working all along with guidance and suggestions from the Maryland Aviation Administration as to what features and capabilities they would like to have available in such a device (Bruce Mundie, MAA 410 859-7064). To begin a formal evaluation our next step is a clarification from the FCC so that these systems may be installed in the field.

By design the SuperUnicom system limits the information it provides to meet FCC part 87.213, which is also consistent with FAA Part 87.213 for Unicom and 87.237 for Multicom CTAF operation. In addition the unit only responds when requested by a pilot, in exact conformance with what a base station operator would do (See below). Simply stated, the SuperUnicom was designed to act exactly like a responsible Unicom/Multicom operator who never sleeps.

I should note that just recently we received a letter from your office in response to an apparent complaint from a competing nearby airfield, with which we share a common advisory frequency. Accordingly we wish to obtain a Rule Interpretation that identifies our SuperUnicom system as a proper advisory service that may be provided over an airport CTAF frequency (Potomac's Station KBE7 is on 122.8 MHz).

I look forward to your comments and suggestions and an opportunity to demonstrate the system.

Thank You,

David Wartofsky
Potomac Airfield

Advisory System Communication Examples.

ADVISORY FUNCTION:

Standard Protocol (Hit or Miss):

INBOUND AIRCRAFT:	"Potomac Airfield, this is Cessna 123 requesting advisories."
POTOMAC UNICOM:	"Potomac Airfield Advisory, winds are currently 240 degrees at 12 knots"

SuperUnicom Protocol (24 Hours, 100% Response):

INBOUND AIRCRAFT:	"Click, click, click"
POTOMAC UNICOM (Busy):	"Potomac Airfield Advisory, wind 240 degrees at 12 knots"

RADIO CHECK FUNCTION:

Standard Protocol (Hit or Miss):

OUTBOUND AIRCRAFT:	"Anyone on unicom, Cessna 123 requests radio check"
POTOMAC UNICOM: (or OTHER AIRCRAFT)	"Loud & Clear"

SuperUnicom Protocol (24 Hours, 100% Response):

OUTBOUND AIRCRAFT:	"Click, click, click, click."
POTOMAC UNICOM:	"Begin Radio Check."
OUTBOUND AIRCRAFT:	"Cessna 123 radio check."
POTOMAC UNICOM (ECHO):	"Cessna 123 radio check."

INSTRUCTION MODE: (Optional)

SuperUnicom: Prior to transmitting its instructions the SuperUnicom checks to see if there is any carrier modulation on the frequency to make sure that no one else is transmitting, and then, if there is also no frequency congestion it then transmits the following:

POTOMAC UNICOM:	"Potomac Airfield, enter 3 clicks for advisory, 4 clicks for radio check."